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Self-assembly of clay nanotubes on hair surface for medical and cosmetic formulations

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Abstract

© The Royal Society of Chemistry. While most hair care formulations are developed on the basis of surfactants or polymers, we introduce self-assembly coating of micro and nanoparticles as the underlying principle for hair modification, protection and enhancement. Halloysite clay nanotubes formed by rolled sheets of aluminosilicate kaolin assemble on the surface of hair forming a robust multilayer coverage. Prior to the application, clay nanotubes were loaded with selected dyes or drug allowing for hair coloring or medical treatment. This facile process is based on a 3-minute application of 1 wt% aqueous dispersion of color/drug loaded halloysite resulting in a ca. 3 μm thick uniform hair surface coating. This technique, which employs a very safe, biocompatible and inexpensive material, is ubiquitous with respect to the species of source of hair and additives in solvent, making it viable as an excipient for conventional medical and veterinarian formulations.

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